US Army Corps
of Engineers
Engineer Research and
Development Center

Fact Sheet

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Vector Product Format (VPF)

Description and Background: Vector Product Format (VPF) was developed by the National Imagery and Mapping Agency (NIMA) as the standard data format for its vector-based products. VPF uses a georelational data model that is designed to be used with any digital geographic data in vector format that can be represented using nodes (points), edges (lines), and faces (areas). VPF defines the format of data objects, while the georelational data model provides the method for organizing the data. VPF organizes data into five hierarchical levels: Database, Library, Coverage, Feature, and Primitive. Geometric primitives (i.e., nodes, edges, faces and text) describe spatial positions and topological relationships at the Primitive Level. Features (i.e., points, lines, areas, and text) are described using feature codes and attribute values at the Feature Level. Geometric primitives and feature data are "related" to each other via the georelational data model to provide a complete depiction and description of features. Features are grouped according to thematic relationships into feature classes (e.g., Roads) within coverages. Coverages group related feature classes (e.g. roads and railroads) into a common theme of data (e.g., transportation). A collection of coverages over the same geographic extent and using the same tiling scheme is called a library (i.e., data set). Libraries are grouped according to distribution and application factors into data bases. A product specification, corresponding to a specific data base product, defines the precise contents of feature tables and implementation of the VPF standard. (Many parts of the standard are optional and are not always implemented.) NIMA products using or planning to use VPF include: VPF Interim Terrain Data (VITD); Digital Nautical Chart (DNC); all Vector Map (VMAP) products to include: VMAP Level 0 (formerly, Digital Chart of the World), Level 1 (vectorized Topographic Line Map), Level 2 (vectorized Joint Operations Graphics), and Urban VMAP (vectorized City Graphics); Foundation Feature Data (FFD); and higher resolution Mission Specific Data Sets (MSDS).

Key Capabilities: VPF was designed to permit the maximum possible use of the standard, yet remains flexible enough to allow the development of standardized application software. Product specifications select from available VPF options to "customize" the data. Key capabilities include:

Direct use design: VPF was designed to be used directly and is not considered a transfer standard.

Self defining table structures: VPF tables are completely defined in table headers.

Extensive data type support: VPF supports all common data types.

Extensive Metadata support: VPF supports user/producer documentation of data (including quality).

Support for all levels of Topology: VPF supports data sets with Level 0 or no topology

(spaghetti data) through full Level 3 planar topology.

Extensive use of indexing: VPF provides mechanisms for indexing variable and fixed length data.

Support for tiled data: VPF allows partitioning of data into subsets (tiles) for enhanced performance and provides mechanisms for tracing feature topology across tile boundaries (called cross-tile topology).

Support for data dictionaries: VPF supports the use of Data Dictionaries to define features, attribute and attribute values. NIMA uses the Feature and Attribute Coding Catalog (FACC) for most of its vector products.

Support for 3-D coordinates: VPF coordinates include a field for implementing elevation values.

Current Status: The current VPF Standard is Military Standard-2407 (titled: Interface Standard for VPF) dated June 28, 1996. An upgraded VPF specification is expected in late 2001.

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July 2001